INSPECTION DEPARTMENT
Assoc.
Factory Mutual
Fire Insurance Companies,
Long Distance Tel.
Main 6214.
31 MILK ST., BOSTON, MASS.

This is copy of report presented by first inspector who reaches the place of the fire. To be immediately transmitted to Dept. to be manifolded and distributed to Insurance Offices.

Fire Card No. --- EMM

FIRE REPORT.

Hours time in Mill Yard ---

Factory of General Conflagration
At Chelsea, Mass.
Index No. ---
Inspected by G.F. Hiller & C.E. Rigby
Inspected on Apr. 12, 14 & 16, 1908

THIS FIRE occurred on date of Sunday, April 12, 1908, *at* 10:30 *hour* A. *M.*
Day of Week Month Date

Fire started in Rag pile in northwest corner of city.
Building & Name of Room

Extent of Fire, 1½ miles southeast, ½ mile wide (average).

SKETCH. Give diagram or section, showing points of compass.

(See sketches attached)

Construction.
Brick—Stone—Wood.
Mill Construction.
Joist Construction.
Special
Single residences, 2 & 3 story tenements, business blocks and public buildings

Direction and force of wind, Northwest; av. velocity 23 miles; max. vel., 39 miles. (See below)

By whom discovered, People in locality *Public alarm given by* Not known *at* 10:44 A.M.

Apparatus used to extinguish, About 30 engines, one fire boat.

Time required to bring apparatus into use. Mill, --- *Public Dept.* 3 mins. *Duration of fire,* Abt. 30 hrs.

LOSS ESTIMATED ~~*not less than $*~~ Abt. $12,000,000 *not over $* --- *Adjusted at $* ---

Sprinklers where fire started? --- *Name of head,* --- Name, type and date installed

How many sprinklers opened? --- *Dry-Pipe System?* --- Name and date installed

Describe apparent action of sprinklers, (sensitiveness and distribution) ---

Greatest number of Hose Streams used at one time, 50 to 60 *Size of Nozzles,* Steamers, 1"-1½"; Fire Boat, 2" *Of Hose,* 2½" C.R.L.

Did water supply prove all right? Yes *Was any defect apparent in action of pumps or streams?* ---

Was any defect needing a remedy shown in supply of fire pails, extent of sprinklers or hydrant pipe, sizes or supply of hose? --- *How was fire managed?* Probably as well as possible.

Cause of the fire, Rags on fire in dump. *As given by* Chief

In the judgment of the Inspector, Same. Rumored incendiarism not proved.

For a Fire in a Storehouse: Also fill out these blanks in addition to the foregoing.

Building open, *Closed,*
In Stock, *What kind,* *When put in,* *How piled,*
In what part of Storehouse,
Stock going in at time of fire, *Stock going out at time of fire,*
Distance of fire from any open door or window,
Men at work, *Where,*

GENERAL REMARKS.

What special lesson is taught by this fire? (As to hazard of process—improvement suggested for this risk or general information useful for the improvement of the insurance work.)

ABSTRACT OF THIS REPORT:

Fire started in rag pile. Very high wind carried sparks to adjoining building; then building one-quarter of a mile away caught, followed by other buildings in path of wind. In about an hour the conflagration was general and in about five hours the fire had burned about 1½ miles to the water's edge.

Main points.- Light construction made large, quick fire; high wind showered burning embers on dry shingled roofs and wooden buildings, starting many fires at the same time far in advance of the fire apparatus at work.

Signature of Inspector

OVER.

In obscure cases, special attention is to be given to any possible cause of spontaneous combustion.

sheets of 4. April 1907.

The following data is compiled from statements of officials, witnesses, and personal investigation since the fire. The Chief of the Chelsea Fire Department states that an alarm was rung at 10:44 A.M., which called his department to a fire in a rag dump near the Boston Blacking Company. While putting out the rag fire, his attention was called to fire on the roof of the Rosin Storage Building of the Blacking Company's plant. As the smoke from the rags was blown by the high wind directly over this building, it is probable that this fire was started by burning material carried by the wind.

A second alarm was then rung in, and while still at work on the Rosin Building another fire was discovered in the rear of a rag house on Maple St., about one-quarter of a mile away. This was probably about eleven o'clock. It is stated that the entire second story seemed to suddenly burst into flame. Another building, a little to the East, also caught, and some time was lost in moving the engines down to these fires.

Chief Spenser sent for help from adjoining cities at about 11:45 A.M. Boston responded with two engines and Everett with one, which, with the three Chelsea engines, was the only apparatus fighting the fire for some time.

While at work on this Rag Building, fire was seen at the Jewish synagogue, corner of Elm Street and Everett Avenue, about one-quarter of a mile down the wind, the roof having caught near the tower. About the same time a 3-story house, at the corner of Walnut and Fourth Streets, was reported on fire. Several other fires nearby were then reported to the Chief, and realizing that the fire had grown beyond his control, he sent a general call to the surrounding cities for all the assistance they could spare.

The sparks as they rose above the burning buildings were carried by the strong wind a considerable distance and were practically showered on the buildings beyond, so that the whole district was in flames instead of having one advancing line of fire, which probably could have been fought to good advantage.

About one-third of the buildings in the burned area were shingled, the others being slate, gravel or tin.

The efforts of the fire department to stop the advance of the fire soon proved useless, and were therefore directed towards keeping the fire from spreading laterally.

The messages to other cities seem to have been seriously delayed as the first call for assistance reached Lynn at 12:35. The steamer arrived at 1:15 and located on Fifth Street, between Cherry and Chestnut Streets. The fire had nearly reached this point, and the engine moved up to a point on Bellingham Street, indicated on the plan. Here it was overtaken by the fire between two and three o'clock and was practically destroyed. Between three and four o'clock the fire had swept the whole of the Bellingham Hill district, and the embers had started the Valvoline Oil Works on Eastern Avenue between Watts and Cottage Streets, and the other oil plants on the water front were burning. By five o'clock the whole of the district shown on the plan had been burned over and the fire was simply burning on the outskirts and finishing the buildings in the interior.

On the western side, fire was stopped by the determined fight of the fire apparatus, and the district between the Magee Furnace Works, Chelsea Square and west of Second Street was saved.

VELOCITY OF WIND:

The records of the Weather Bureau for Sunday, April 12, 1908, give the following data.

Time	Average Velocity Miles per hour	Maximum Velocity Miles per hour
10 - 11 A.M.	26	34
11 - 12	29	38
12 - 1 P.M.	34	39
1 - 2	28	31
2 - 3	30	38
3 - 4	30	36
4 - 5	30	36
5 - 6	24	28
6 - 7	21	29

From 7 to 12 P.M. the average velocity was about 14 miles per hour. The wind was northwest till 7 P.M., varying between northwest and west till 10:30, and after that west. The temperature was between 40° and 50° Fah.

OIL WORKS:

In the yard of the Tide Water Oil Company were five oil tanks with a total capacity of 500,000-gallons, and at the Lamp Black Works to the west was more oil in storage. All of this oil took fire here, probably from burning embers, and as the tanks collapsed the burning oil ran out on the water of the creek and spread across to the East Boston shore. The draw bridge on Eastern Avenue (see plan) was totally wrecked, the heavy plate girders in the sides being badly twisted and part of the structure falling into the water. The bridge near the Pumping Station was also burned, this being supported on piles. The Metropolitan Sewerage Pumping Station caught fire from the burning oil and the roof was burned off, the engines seriously damaged, and the coal pocket entirely destroyed.

The Standard Oil plant, also on the East Boston side of the creek, caught fire, and one building containing four oil tanks of about 100,000-gallons capacity each was burned, together with several smaller sheds and buildings in the yard. Under this tank building was a basement into which the oil flowed and burned itself out. The large tanks in the yard are all surrounded by earth and concrete embankments, but as these tanks did not take fire this method of protection was not tested. No oil escaped from the Standard Oil Works to the water.

There were no embankments nor provision for draining the oil tanks on the Chelsea side. The complete destruction and collapse of the large tanks at the Valvoline Oil Company, some distance from the water, is a particularly graphic illustration of the action of the burning oil.

EAST BOSTON:

About twenty fires were reported in East Boston,- the first ones about one o'clock, and then every few minutes during the afternoon. They were all caused by burning embers setting fire to the roof, and were extinguished without great loss by the efficient work of the Boston Department. Six engines were located and lines laid throughout the district threatened, and it was only by an efficient and determined fight that East Boston was saved.

WATER SUPPLY:

On the accompanying map, the arrangement and size of the water pipe system is shown for both high and low services. Both these services are supplied from the Metropolitan Water Works. The low service is brought through Second Street in a 42-inch pipe from the Chestnut Hill reservoir and delivered through a 24-inch Venturi meter into the 16-inch city main on Broadway. The 42-inch main continues along Broadway to Williams Street, from which point a 24-inch pipe

extends to Boston by way of Broadway, and a 24-inch pipe extends to East Boston by way of Marginal Street, crossing the creek near Shawmut Street. At this point there is an emergency connection with the 10-inch service main in Marginal Street. There is another emergency connection between the 42-inch supply and the 10-inch service main in Second Street near the Everett line, and also a connection at this point with the Everett 10-inch service main. There is one other 6-inch emergency connection between the Everett and Chelsea mains at Everett Avenue, near the city line.

The high service is usually supplied from the 1,250,000-gallon reservoir on Powder Horn Hill, supplied by a 16-inch pipe from the northern high service reservoir of the Metropolitan Water Works at Middlesex Fells. There is an emergency connection direct from the 16-inch main to the 10-inch service pipe at the top of Powder Horn Hill. There are two high service districts,- one at Bellingham Hill in the southern section of the city, and one in the vicinity of Powder Horn Hill.

All of these emergency connections were opened by a Chelsea Water Works man, and both high and low supplies were available throughout the fire.

The pressure at the Revere Rubber Works, about 3 o'clock was 42-lbs., the ordinary static pressure being 60-lbs.

The pressure at the Forbes Lithograph Mfg. Co. at 3 o'clock was 27-lbs., and at 4 o'clock it was 14-lbs. Normal static pressure, 50-lbs.

One of the Boston engines, arriving on the fourth alarm, located at 12:30 on the corner of Fifth Street and Broadway, and found 5-lbs. pressure at the hydrant. Another engine, located near them on Shurtleff St., found no pressure at the hydrant. The first engine moved to the corner of Fifth and Poplar Streets at one o'clock and found 5-lbs. pressure to 10-inches vacuum. At this time both sides of Walnut St. were burning fiercely as far as the engineer could see. As the fire approached, he was driven back to the corner of Sixth and Poplar where the pressure was practically nothing at 1:30. He, however, was giving two streams at 100-lbs. pressure with a 10-inch vacuum. He was later driven to the corner of Blossom St. and Washington Avenue, at 4 P.M., where he found no pressure He then went around the fire to Chelsea Square, arriving there about 5 o'clock, where he found 10-lbs. at the hydrant, but on account of not being able to get hose did not do any work. Early in the afternoon this company lost their hose by burning embers falling on the hose and burning through the fabric. 1100-feet belonging to one company was lost in this way, and this occurred in several other cases. This company finally used some hose from one of the outlying towns, which proved to be of light weight and would not stand more than the 100-lbs. pressure which was maintained by the engine.

Several instances on Bellingham and Powder Horn Hills were noted where water could not be obtained after 3 P.M.

In East Boston the engines found about 25-lbs. pressure during Sunday afternoon, the normal being about 50-lbs.

The Metropolitan Water Works estimates from pump records an excess consumption for Chelsea of 17,000,000-gallons on Sunday and 12,000,000-gallons on Monday. 2,000,000-gallons is estimated as due to waste from broken pipes and hydrants for each day, making the total water used on fire 25,000,000-gallons. This is the equivalent of a week's supply for a city like Lawrence or Fall River, Mass.

East Boston shows an excess of 1,250,000-gallons on Sunday.

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https://archive.org/details/firereport00hill

The fire boat was located in the vicinity of the Oil Works mentioned above. Part of the time the water was low and they pumped a considerable amount of mud, so that the efficiency of the boat was reduced. It gave five 3-inch streams from monitor nozzles and three 1½-inch streams. At one time it had to protect itself from burning oil on the water by using its own streams on its sides.

GENERAL NOTES:

The burned area is about five times as large as that of the Boston fire of 1872, and twice that of Baltimore in 1904.

The extreme rapidity of the progress of this fire is shown by the following comparison of average speeds:

Paterson	burned	1/2	miles	in	18	hours,	or	150	feet	per	hour
Baltimore	"	3/4	"	"	25	"	"	160	"	"	"
Chelsea	"	1-1/2	"	"	6	"	"	1300	"	"	"

Dynamite was not used to blow up buildings.

Couplings on hose from adjoining cities were interchangeable.

Granite curbing is chipped off for long distances and the lead holding hydrant nipples in place is melted out.

The plant of the Magee Furnace Company was not burned. The Revere Rubber Company (Index No.664 Mass.), now insured in these companies, was outside the limits of the conflagration district and was not harmed.

The Griffin Car Wheel Company, on the edge of the burned district, at the junction of the railroad tracks, was saved by the efficient work of its fire brigade in keeping the buildings wet down, and sparks, as they fell, extinguished.

The freight station of the Standard Oil Company, at the Everett Avenue crossing, was protected and the fire checked by the private chemical extinguishers until assistance from an engine arrived, when the fire was stopped at this point.

LESSONS:

1- The importance of carefully considering the conflagration hazard where quick-burning buildings of light construction adjoin valuable properties.
2- The value of wide spaces, like the railroad location through the city, where such fires may be fought and stopped. City parks should have several hydrants around them, so that department could be supplied and make a good stand against such a fire.
3- The danger in congested districts from shingled roofs, which catch fire easily, and from which burning embers are readily blown by the wind.
4- The value of determined fighting by city department, as shown in East Boston where sufficient water was available.
5- The fire department would have been assisted in its fight if the roofs had been watched by the residents themselves, and sparks extinguished as they fell.
6- A thoroughly good high service system is important in a congested dis-

trict. Each member of a fire company can be stationed at hydrant along a street and thus protect a large area effectively.

7- A city of this size should have more than three active engines in service.

8- An efficient method should be arranged for calling assistance from neighboring cities.

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In regard to the water supply at Chelsea, no discredit can be justly given. The supply from the 42-inch main with its several extra connections, the 16-inch high service, and the 24-inch to Charlestown, which during the fire was supplying water to Chelsea from other connections beyond, constitutes a thoroughly good supply. The grid-iron system, especially through the burned district, was liberal, being made up of 8- and 10-inch lines with 6- and 8-inch cross connections. In spite of these good conditions, the pressure became very low, due to the enormous waste from broken house connections and the large draft from the many engines. This, however, did not hamper the work of the steamers materially.

Congested districts of wooden construction, shingled roofs, dry weather, a high wind, and a good start would duplicate this conflagration in many of our cities.

Respectfully submitted,

G. F. Hiller.
C. E. Rigby.

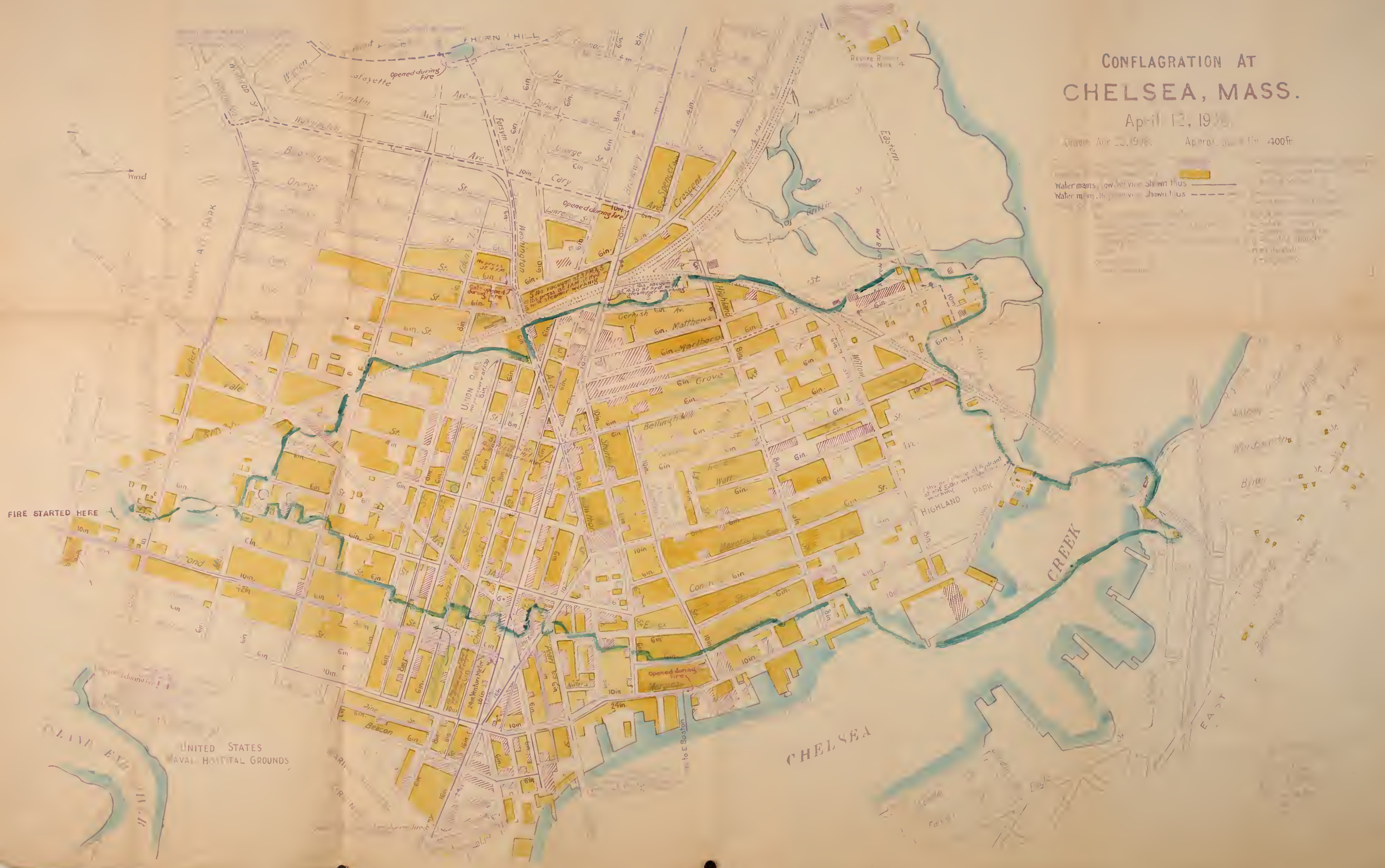
CONFLAGRATION AT
CHELSEA, MASS.

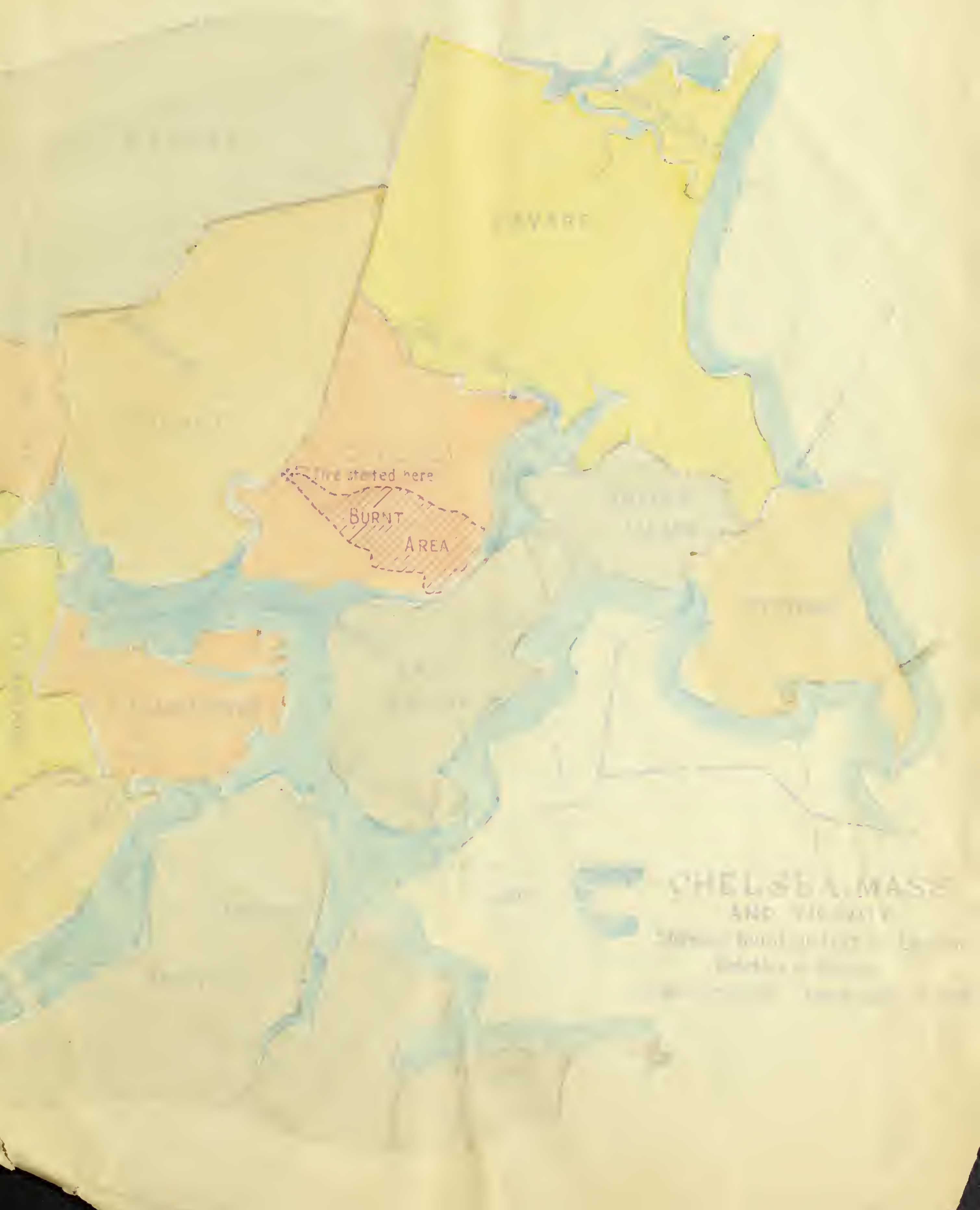
April 12, 1908.

Drawn Apr 22, 1908. Approx. scale 1 in = 400 ft

Water mains, low service shown thus ————

Water mains, high service shown thus - - - - -




REVERE
Fire started here
BURNT AREA
CHELSEA, MASS.
AND VICINITY